WILTSHIRE & GRANNIS LLP

April 25, 2013

Ex Parte

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street SW
Washington, DC 20554

Re: GN Docket No. 12-268

Dear Ms. Dortch:

On April 23, 2013, Alan Norman and Aparna Sridhar of Google Inc., Vinko Erceg, Ron Porat, and Chris Szymanski of Broadcom, and I met with Gary Epstein and Edward Smith of the Incentive Auction Task Force; John Gabrysch of the Media Bureau; Jessica Almond, Blaise Scinto, Madelaine Maior, Chris Helzer, Jennifer Tomchin and AJ Glusman of the Wireless Telecommunications Bureau; Ira Keltz, Aspasia Paroutsas, Robert Weller, Jamison Prime, Mark Settle, and Alan Stillwell of the Office of Engineering and Technology; and Evan Kwerel of the Office of Strategic Planning and Policy Analysis, about the above-captioned proceeding.

During this meeting, Google and Broadcom stated that the FCC should: (1) adopt the "51-down" band plan option; (2) permit consumers to use unlicensed technologies in the guard band and duplex gap found in this band plan; and (3) permit consumers to use unlicensed technologies in Channel 37 and the two channels currently reserved for wireless microphones. We distributed the attached presentations.

Pursuant to the Commission's rules, a copy of this notice is being filed electronically in the above-referenced docket. If you require any additional information please contact the undersigned.

Sincerely,

Paul Margie
Counsel to Google Inc.

cc: Meeting participants

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Incentive Auctions Presentation

A successful auction benefits everyone

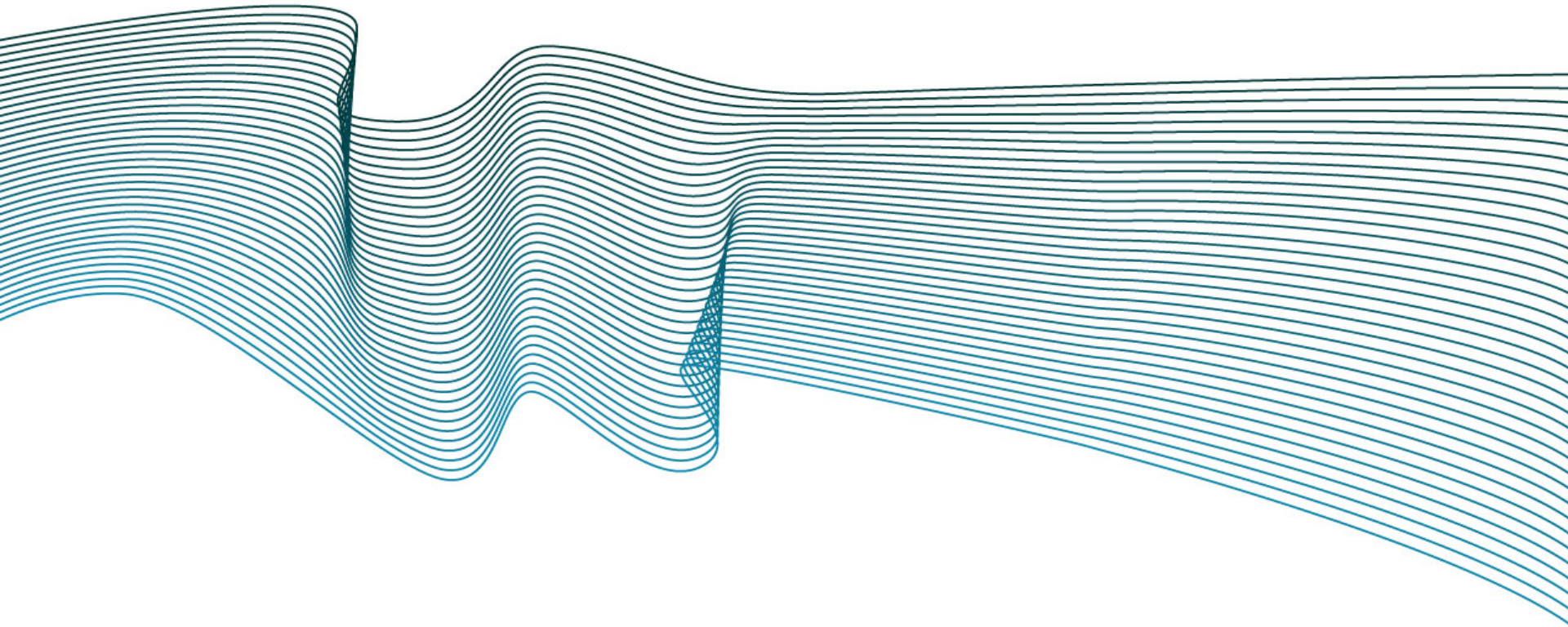
- Users depend on licensed and unlicensed spectrum to access the Internet. Google wants the 600 MHz band auction to succeed: doing so will free up valuable additional spectrum for mobile broadband.
- We also believe the Commission will need to rely on a variety of approaches to free enough spectrum to meet consumers' growing needs for mobile data.
- We understand that the primary goal of the auction is to license additional spectrum for mobile broadband.
- Like other commenters, we believe that the Commission's "51-down" plan provides the best chance for national harmonization and minimizes potential interference challenges.

The Commission can designate spectrum for unlicensed use without compromising licensed allocations

- **Guard band and duplex gap:** There must be a guard band between broadcast and LTE downlink to avoid interference between those two services. Similarly, the Commission should establish a duplex gap between LTE uplink and LTE downlink. These locations are inappropriate for licensed services and carriers agree that they are suitable for unlicensed services. Making these protective spaces appropriately large will increase the quality and reduce the cost of broadcast and licensed services, while making them too small risks serious interference concerns down the road.
- **Two reserved channels:** The Commission currently reserves two channels for the exclusive use of wireless microphones. These under-utilized channels should be shared with unlicensed users.
- **Channel 37:** If the Commission leaves radio astronomy and medical telemetry applications in Channel 37, then these incumbents should be granted protection via a database, and in areas where they are not present, the Channel 37 spectrum should be made available for unlicensed use.

Services offered in potential unlicensed designations can make use of existing standards

- IEEE is developing a standard for white spaces – 802.11af.
- This standard was created to allow use of vacant 6 MHz broadcast channels to deliver Wi-Fi.
- Three of the unlicensed designations proposed here (the two reserved channels and Channel 37) are 6 MHz-wide.
- Depending on their sizes, the guard band, duplex gap, previously reserved channels, and Channel 37 could yield enough 6 MHz channels to support unlicensed operations. They could also be combined with remaining white spaces. Taken together, these channels could be used to deploy Wi-Fi using the 802.11af standard.



INCENTIVE AUCTION PROCEEDING

23 April 2013

GENERAL VIEWS ON INCENTIVE AUCTION PROCEEDING

1. Maximize 600 MHz proceeding thru proper band plan design

- Adequate guard band size to minimize interference from hi-power broadcasters into LTE
  - Broadcasters, carriers, semiconductor device makers seem to agree that the guard band size should be greater than 10 MHz to avoid harmful interference

2. Maximize public benefit of spectrum thru unlicensed use

- For the economics to work, there must be at least four 6 MHz channels
  - According to WiFi alliance reply comment, docket 12-268: "*For a successful TVWS market, every household should be able to access at least four UHF TVWS channels with more than 99% confidence*"
- The following channels are likely sources:
  - Channel 37 (database access)
  - The two channels reserved for wireless microphones (database access)
  - The guard bands
  - The Duplex gap (assuming down from 51 plan)

TAKEAWAYS FROM 12-151

- **Lower power unlicensed can exist in duplex gap and guard bands based on previous ruling:**
  - FCC report and order 12-151 pertaining to unlicensed operation in AWS-4 2000-2020 MHz band could be used as a guideline for unlicensed use
  - FCC resolved interference concerns between UL cellular in 2000-2020MHz and the DL cellular in the PCS bands below 1995 MHz and in as yet to be allocated upper H block band 1995-2000MHz
- **We agree with the FCC's decision that all spectrum should be utilized**
  - *The FCC found that enabling usage in 1995-2000 MHz was more important than reducing potential interference in response to DISH request that the spectrum serve only as a guard band*

RECOMMENDATIONS

- **For operation of unlicensed devices near LTE DL in the 600 MHz, we recommend that the FCC consider its previous findings:**
  - *Requiring attenuation of 70+10log10(P) of cellular UL in 2000-2020 MHz band is sufficient to protect cellular DL below 1995MHz - 5 MHz separation*
  - *Requiring attenuation of 70+10log10(P) of cellular UL in 2000-2020 MHz band is also sufficient to protect cellular DL in the adjacent band 1995-2000MHz*
  - *Limiting the allowed transmit power only in the adjacent 2000-2005 MHz band to 5 mW to guarantee blocking performance of cellular devices operating in the 1995-2000 MHz H block*
- **Guard band between broadcasters and LTE downlink of at least 12 MHz particularly useful, potentially allows up to 2 channels for operation of 802.11af, a newly developed standard for operation in TVWS 6 MHz channels**
- **The FCC should consider usage of the 40 mW personal/portable device class pursuant to current FCC TVWS rules in the guard band and duplex gap**
  - Methodology as described in paragraphs 140-143 can be applied (with appropriate modifications to the 650 MHz band) to limit the transmit power in only the 5 MHz adjacent to LTE DL (guard band and duplex gap)
- **Taken together, these proposals may enable efficient use of all the spectrum available**